David Krech, FCC

Thank you. Trevor.

Trevor Roycroft, Ohio University

I will pass also.

David Krech, FCC

Page.

William Page Montgomery, Montgomery Consulting

I will largely pass, except to say that beyond the things, the technical aspects of validating a model or models, there are other ways to address the problem given the information limitations I think that people will encounter in trying to do that. And one way is to design the overall universal service mechanism in a way that makes it effectively portable among people so that the market can begin to pick up on what Rick Emmerson said. The market can begin to test whether the numbers that come out of the original plan induce people to extend their networks into those areas to seek out certain customers and achieve a portable subsidy. That's a very good way of validating, although it's not validating in the econometric sense of the word.

David Krech, FCC

Thank you. Vin.

Vincent Callahan, NYNEX

Just one final word. You may (inaudible) about the models and proxies and deadlines that the regulator faces in trying to implement this Telecommunications Act. One alternative which Joel alluded to and I've been thinking about it, you may want to think about using the state proceedings that you developed in developing unbundled network elements as a basis for universal service support on an interim basis. You may think about — that may give you the opportunity to avoid the arbitrage, it may give you an opportunity to avoid all the administrative nightmares that you would face counting CBGs for a while, it would give the people here an opportunity to develop the model further, and it would probably allow you to use forward-looking costs as opposed to embedded costs to get the Telecommunications Act implemented.

David Krech, FCC

All right, well, your name was just mentioned, so it's your turn again, Joel.

Joel B. Shifman, Maine Public Utilities Commission

The proof is in the pudding, that if a model creates results that miss actual reality thus far, then there's no easy way out

of it, you have to look as see whether or not the reason it misses reality is because the incumbent is providing service inefficiently. Then you've got to just basically focus on what's causing it to miss reality, and if you can't find any reasons why the incumbent was inefficient, why a CLEC can't come in there and do it any cheaper, then you just know that the model can't be validated, the model just doesn't work. And that in several instances, you know there's two issues. There's issues whether the model overstates costs. I think that's a problem, but it's not nearly as great a problem as whether the model understates costs, because a company is going to die if it understates costs. And that if you find out that it understates costs, and you find serious and you can't explain and fix the model to do that, then you should not implement the model until you have fixed it. You just can't do it. People are going to die.

David Krech, FCC

Thank you. Ben.

Ben Johnson, Ben Johnson Associates

I'll just reiterate at a more global level my earlier comments which is I think the most important thing procedurally that the FCC can do is to have very clear focus to the subsequent rounds of comments that are going to be available over these next couple of months. Don't just allow this thing for everybody to be shooting past each other. I'm sure that out of the folks that

want to comment, many of then aren't here today. Many of them maybe fundamentally disagree with the decisions or tentative decisions that have already been made, so you need to give them focus, you need to say very specifically, "we want feedback on these inputs, we want feedbacks on these specific issues, we want specific criticisms, strengths and weaknesses of the various models," so that ultimately you can decide if you're picking a model or if you're going to create your own composite model with the best of the various ones, whatever approach you're taking, you have as much input as possible. And the folks that are only in the role of saying, "no, this whole idea is wrong, we ought to be doing embedded costs," they need to be contributing too by sort of structuring their input.

Daniel Kelley, Hatfield Associates

We need to go back to the first principles here and I'll echo what some of the other panelists have said. What we're about here is trying to figure out a mechanism to determine universal service subsidies. We need a universal service in this country, according to Congress, that is maintained and therefore we need subsidies that are adequate to maintain that service. We don't want subsidies that are too low, therefore we endanger universal service. We don't want subsidies that are too high, it's unnecessary cost and, as you heard, it can have some adverse competitive implications. The only way I know of doing that is to use an engineering economic analysis of forward economic costs, forward-looking economic costs of providing basic

universal service. We don't want to look at models that tell us what the cost of providing Centrex are. We don't want to look at models that tell us what the cost of providing inter-latta official service networks are. We don't want models that tell us what the costs of providing broad band capability are, or information services. We need a model that's designed to measure the costs of providing basic universal service and that's what the Hatfield Model does.

David Krech, FCC

Rick.

Richard Emmerson, INDETEC International

I have a couple of comments. One is we've heard a lot of comments regarding verifying the data, especially the input data with respect to the real world. And while the models are very different, it is important to get the input data right. Companies can't do that. They are under proprietary agreements with equipment vendors. I think only the FCC really has the ability to extract the data necessary to verify some of the equipment prices, switch prices and the like. Be very careful, though, when that information comes forward because it's life-cycle information that's needed. One can't go out and say because one vendor gave a discount on an initial switch placement and a high price on subsequent additions and another vendor did the reverse, that we can pick and choose among those. So,

careful verification of input and equipment prices are important. The second point is that while the Hatfield Model claims to have validated, I would very strongly disagree with that. It's been examined very, very closely. It has not been validated with respect to the criteria I earlier listed. Finally, let's not evaluate the Universal Service Model in terms of its ability to do things other than universal service. An integrated network providing universal service will not provide component costs which are appropriate to taking that network apart and selling it part by part. Thank you.

David Krech, FCC

Thank you. Are there any final remarks from the panelists before we turn to audience questions? Seeing none, do we have any questions from our state regulators? Roland? Again, in asking questions, if you could please use the microphone and identify yourself before you ask the question.

Roland Curry, Texas PUC

My name is Roland Curry and I'm from the Texas PUC staff. My question, I guess, is directed primarily at Dr. Johnson. And on your model, as I understand it, and I haven't had a good chance to work a lot with it, just seen some of the stuff on it. It does its calculation by wire center, is that correct? And, I guess what my —

Ben Johnson, Ben Johnson Associates

Costs are built up at below the wire center level and they're reported at either the wire center or two zones, a high-cost and a low-cost zone.

Roland Curry, Texas PUC

Okay. And I guess my question is, is there any mechanism available which would allow us to roll that up, either by company or by existing study area?

Ben Johnson, Ben Johnson Associates

Yes. The easiest, for the moment, is simply you can either run the results and tally them or we could enter into a license agreement to give you the software you need in order to automate the process, which is what we obviously use in order to make our filing. But in terms of just generally making this software available to competitors, that roll-up process is something we are freely licensing to anybody and everybody, but we'd be certainly happy to provide to any regulators that would want it in order to validate or other purposes.

Roland Curry, Texas PUC

Would that be available to Joint Board staff?

Ben Johnson, Ben Johnson Associates

Sure, yes, that's not a problem. If you look closely at our license agreement, it says if you need to do any of the things that you haven't already been authorized to do, just contact us and that's the type of thing we had in mind.

Roland Curry, Texas PUC

Thanks.

David Krech, FCC

Thank you, Roland. Any other state representative have a question? Brian.

Brian Roberts, California PUC

Hello, I'm Brian Roberts from the California PUC. And Joel, you mentioned that the BCM2, you had some concerns about the road overlay and limitations that it did on the household distribution, and I was wondering if you've looked into that at all?

Joel B. Shifman, Maine Public Utilities Commission

Yes, I have. And part of the problem with the BCM2 road overlay, it is an improvement over BCM1, but still it does not reflect the actual locations of customers and the clustering of

customers along the roads. And that — let me give you some very good examples that — in the Midwest, essentially farms are scattered out pretty homogeneously, but with major clustering in the towns, in the villages.

In Appalachia, there's less clustering in the villages, the villages are smaller, and there is more scattering out of the farms and the dwellings and they're apt to be further back from the roads, yielding very divergent cross characteristics. And that number one, that clustering determining statistically sampling areas within various regions of the country, let's say the Midwest, let's say the Rockies, let's say California, say Appalachia, in determining where — how customers are likely to be scattered, how large the villages are on the average, will impact costs fairly greatly and that the — when I tried to figure out some of the reasons why the ratios between fairly recent project costs in the Midwest were several times — just as Lisa found out — several times the actual expended costs and why they were fairly close, if not deficient in Appalachia and in the intermountain west, the primary driver for that problem was the location of customers within the CBGs, that they were not uniformly distributed along the roads, and in some areas that customers were not even located on the roads. Particularly I was looking at — I was talking to a company that serves several areas of the Bayous in the South. And they told me that, not just anecdotal, but lots of customers live in areas where they park the car on one side of the Bayou, they take a boat across to the other side. And so, assuming that the customers live along

the roads under states' costs, and so the assumption of uniform distribution along the roads is just not a valid assumption and you have to replace it with something else that's more valid, and you can do that through statistical sampling.

David Krech, FCC

Thank you. Anybody else on the panel want to address that issue?

Richard Emmerson, INDETEC International

I guess I agree with a certain extent to what you say. The road swath may not solve every problem. However, it solves the vast majority of such problems, in my opinion. Where it doesn't solve the problems, the BCPM is perfectly prepared to go the next level and examine census blocks as opposed to census block groups. If that doesn't solve the problem, we'd be prepared to go to 3,000-foot grid cells. If that doesn't solve it, and the data could be made available, we'd go to the premise. The point is, the capability to go there is there and obviously, in keeping with Page Montgomery's earlier remark, we do need to draw a line. These are, after all, only proxy models. But, somewhere between the census block group, the road swath and whatever next layer could be added to it is probably the final solution. So, I guess I'm in a large part agreeing with your comment, but also urging you to take it too far to expect precise resolution of this problem in every CBG.

David Krech, FCC

Dan.

Daniel Kelley, Hatfield Associates

I think I would generally agree. You know, if we go too far, we're going to end up with a map we started talking about. But, if there are special cases that require analysis below the CBG level, the model will do that, or can be made to do that. And we can go to levels below that in particular cases.

David Krech, FCC

Anybody else?

Joel B. Shifman, Maine Public Utilities Commission

Yes, I'd like to respond that there's not just specific cases. That the model assuming uniform distribution along the roads is not a specific case problem. It overstates costs, in a whole slew of states almost grossly, Nebraska, South Dakota, Oklahoma. If you look at those states and you look at the way population really is, versus the way the model assumes it is, costs are so vastly overstated that the size of the fund that's predicted by either Hatfield or BCM2, because of the high amount of dollars needed in the Midwest, in those states, because of deficiencies in the model, are so great that you have to fix

those things, not just on a case-by-case basis. There are some gross fixes that have to be made before the models are usable.

David Krech, FCC

Thank you. Are there any other questions from the state regulators? Any other questions from the audience? Yes, a former panelist.

Lawrence P. Cole, GTE Laboratories, Inc.

Larry Cole, GTE Labs. When the question was being answered about the possible roles for econometric modeling in validation, nobody mentioned the possibly of generating pseudo-data with the models and doing something econometrically on that. And I was wondering whether you'd thought about it and rejected it and there isn't a useful role, or now that I'd mentioned it, maybe there is?

David Krech, FCC

Who would like to — Ben, you leaned forward, so I guess you're first.

Ben Johnson, Ben Johnson Associates

Right. I'm not 100% sure if I'm clear on what kind of pseudo-data he's talking about, but I do think that's one interesting thing that can be explored, and that with our model

I'd been thinking about doing in terms of academic papers or whatever, because you can (inaudible) generate enough different examples that eventually you can start extracting from those examples, sort of at a hyper level, certain relationships that are inherent in the model. And potentially you could compare that to other kinds of data. Beyond that, I'm not really sure specifically what he was suggesting, but I think there is potential for all these models in that direction.

David Krech, FCC

Would anybody else care to address that issue? Rick.

Richard Emmerson, INDETEC International

Yes, I'd just like to say that I think we need to make sure the horse says before the cart. Obviously, we need to get to the point where we're comfortable with the model outputs before we can believe that the pseudo-data it generates can be used for any other purpose. And I think that's probably some ways downstream as opposed to an immediate effort.

David Krech, FCC

Anybody else on the panel? Any other questions from the — oh, excuse —

John Schrotenboer, Southwestern Bell Telephone Company

One of the things that we had considered doing and haven't got around to doing with all of the other model things that are going on is trying to look at whether or not it would make sense to go in and put some actual data in the models in terms of fill factors, prices, etc., run the model and see what the results are. That might give us an indication of what the differences are in terms of the overall structure and those type things. I don't know, like you said, we haven't gotten that far yet, but that might be something that could be done to test the models.

David Krech, FCC

Anyone else? Any other questions from the audience? Please step up and use the microphone.

John Herring, Strategic Policy Research

My name is John Herring. I'm a partner of Jeff Rohlfs and I used to be the Chief of Plans and Policy at the FCC and I have a question for Dan Kelley, my old friend and nemesis, I guess. I don't know, we seem to have been on the opposite side of battles, although Dan is a former OPP'er, so I don't know where he went wrong in terms of — or where I went wrong in terms of our view of things. Dan, you ended up emphasizing why it was important to get it right because we would end up making — having some losses associated with decision errors, if we got it wrong. We would overcompensate or undercompensate, with adverse consequences for

universal service and/or competition. And you then said the criterion should be — or your method for avoiding that was emphasized, obviously, looking at forward-looking costs, and only the forward-looking costs of the particular activities that seem to be ill-defined, I think, as I listened to the conversation. One of the things that people seem to be looking for at the FCC is "well, what is it we're estimating the costs of?"

I wondered, though, that — it strikes me being an old, sort of Kosien, somebody's who's interested in the economics of the firm. If there are economies of scope in these activities, won't your methodology almost fore ordain that you will — and your methodology will end up overstating the costs? And Lau, if you'd like to comment as well, I'd be interested to hear your version. One more remark, there seems to be only one economics, but many versions of what economics says, so —

Daniel Kelley, Hatfield Associates

John, let me ask you a clarifying questions. Economies of scope between what and what?

John Herring, Strategic Policy Research

You mentioned some activities, other activities that incumbent LECs, for example, might be engaged in in terms of their networks. I'll leave it unspecific, but any number of activities that — the flavor of it came though, I think, in Jeff's remark about the cost of, say, a local operation in

Washington that was stand-alone versus one that was part of, say, Bell Atlantic's larger empire.

Daniel Kelley, Hatfield Associates

Okay, if it is true, as several LECs alleged in the course of the video dial tone proceedings, that building a hybrid fiber co-ax network is a more efficient way to provide all services, then, yes, I guess our model may be conservative in the sense that it's generating costs that are too high. That's the first time I've heard someone working on the LEC side of the issue criticize us for having costs that are too high.

Laurits R. Christensen, Christensen Associates, Inc.

Yes, I guess I'm not (inaudible) what the concern is, since the principles set out by the Joint Board explicitly said that networks should be modeled by these proxy models that would take advantage of economies of scope and economies of scale, what I like to call "economies of density." And, as far as I can see that the — both of these models that I've looked at at this time are doing that, so I guess I don't see the sense in which they would be interpreted as overstating costs.

David Krech, FCC

Anybody else on the panel want to address this issue?

Joel B. Shifman, Maine Public Utilities Commission

Yes, and I guess I look around at the fellow panel members, and I'm not even — I'm probably one of the closest to being an engineer, and I'm not even an engineer, I'm a physicist, but — you look around and I see a whole lot of economists talking in a sort of a — not very many engineers seeing whether these models work and whether the numbers used are reasonable. I thought the suggestion made yesterday that we have sort of a team of engineers look at the assumptions that go into these models, look at whether the economies of scale and scope are adequately reflected from an engineering point of view are very valid, that I would love to see an independent team of engineers evaluate the models from an engineering sense rather than from an economic sense. I think that that's been something that's deficient thus far in this process.

Daniel Kelley, Hatfield Associates

If I can respond to that just briefly. It happens that Hatfield Associates isn't a very large firm, but it also happens that I'm the only economist at the firm, the rest of us are engineers who came up through the telephone companies, and through Bell Labs, and we have relied very extensive on outside experts from our firm who are engineers, so, I think we've got the ball rolling in that respect anyway.

David Krech, FCC

Any other comments? Any other questions from the audience? Yes, David Gabel.

David Gabel, Queens College

David Gabel, Queens College. This is a question for Jeffery Rohlfs. Dr. Rohlfs, you talked about the value of using a top-down model. And as I'm listening to your description, I'm trying to tie it into how I understand these bottom-up models work, and I'm wondering if you tie something together for me. When I hear about the bottom-up models, I hear, for example, that distribution plant is designed to satisfy demand for 15 or 20 years prospectively, because people don't want to go out and dig up the neighborhood again. So since facilities are installed to satisfy future demand, how does a top-down model take into account prospective demand when estimating prospective incremental costs?

Jeffery H. Rohlfs, Strategic Policy Research

The top-down model explains costs in two directions. One is it explains costs from one company to another, and you try to understand why the costs of one company may differ from another. And a likely reason that they may differ is that one company has more subscribers than the other, it handles more usage. And those will end up being the estimated parameters. In terms of the model being forward looking, one of the things that we tried

in our model was to estimate a time trend to find out how costs are changing over time. And what we found is that on a nominal level, incremental costs are remaining about constant over time, which means that the real rate of decline of incremental costs is about 3% a year. That's roughly consistent with what the state and Federal Commissions have found with regard to setting price cap productivity factors, bearing in mind, though, that these are just incremental costs and the price cap and X factors, for example, need to reflect productivity gains and non-incremental costs as well. So, that's the basis on which we estimated the model. By its nature, a top-down model doesn't do detailed engineering modeling as is done with the bottom-up approach.

David Krech, FCC

Anyone else on the panel care to address the issue? Any other questions from the audience? Going, going — yes, Alex? It's getting to the point where the audience is small enough I know everybody who's asking questions. Alex Belafonte?

Alex Belafonte, FCC

Alex Belafonte, FCC. There have been some references to data that is not currently publicly available which it would be nice to have. And, I want to elaborate on this a little more. Knowing that it's the general inclination of many of the regulators to try to rely on currently available public data, what data that's not currently publicly available would you like

to see collected, keeping in mind that this will involve a data request to telephone companies and/or other organizations. And the fact that we have to go through OMB clearance to do any kind of data collect?

David Krech, FCC

Joel is chomping at the bit, so let him go.

Joel B. Shifman, Maine Public Utilities Commission

Yes. I'll tell you something, though, I've had a little bit of an advantage in trying to validate and look at stuff because I have the 1982-1986 Joint Board sort of bodacious data request from a year and a half ago, and a lot of that is public, I don't remember what is public and — but, I think that if that was made totally public, perhaps with the company identities masked, so that you know what the exchange is, what size it is, maybe not where it is or who it is, but at least you know what the characteristics of that exchange are, that would be a help in analyzing some of the model results. I don't know what the legal status of that data request is, but a lot of the stuff that people — things that Ben was suggesting, access lines by sili-code, we got that.

Ben Johnson, Ben Johnson Associates

Well, all I know is that in every proceeding I've asked for it in discovery, we've always gotten it upon request and they

have always insisted that they keep it secret so that MCI and AT&T would not be allowed to look at it. Now, the theory is, we don't want to give that competitive edge to our competitors, that they'll know where our customers are. I find that somewhat fallacious in that their serving them for toll purposes, they probably know just about as much as anyone else. But it put everyone at a disadvantage. And I think Southwestern Bell volunteered, in this proceeding to provide exactly that kind of information. I think that's the more appropriate approach and that's the one specific data request that I think should be mandatory. And to the extent some of the smaller companies have trouble doing it, give them extra time. But, I think it will be very useful for validating the models to know business and residence lines by sili-code for every wire center in the country.

Joel B. Shifman, Maine Public Utilities Commission

For modeling, intra-latta usage or access. We need to know traffic data too.

Ben Johnson, Ben Johnson Associates

Yes, and that, to the extent slew data is already available that's already been generated and it's a matter of just reporting it, that would also be useful. I've got some ideas of the formatting of it. But, I wouldn't want to burden the companies providing more detail than we can deal with, but there is that

kind of data that's routinely generated for separations purposes, and that would help with precision as well, particularly as you get into access.

Richard Emmerson, INDETEC International

With respect to data from vendors such as switch vendors in particular where there's been some explicit controversy during this proceeding, I think vendors will be very, very hesitant and perhaps would fight tooth and nail not to provide the precise terms and conditions of the sale to their customers. There are list prices available. They're provided, for example, the Bell Core one, Bell Core makes their SCIS models. There are typically discounts off those list prices. When one runs a cost study, very commonly the discount that's used is not a reflection of the precise terms and conditions of the vendor's switch sale, but a weighted average of discounts, weighted by, for example, initial switch installations or switch replacements are additions to switches. At the very least, I think one should attempt to get a weighted average discount of switch prices, perhaps stopping short of asking for the precise terms and conditions of the sale. But I do think that represents what I consider to be a realistic starting point for a data request to be negotiated away from there to protect everybody's interest.

Daniel Kelley, Hatfield Associates

I agree with that. We need those input prices. And I think one way to get it, perhaps, is to establish a rule here and that is, we have 400 inputs and we get criticized by the telephone companies for the size of a lot of them. And I would like to see in any case where they think our input cost is too high, particularly in the cost of equipment, let them show us their data. And unless they're willing to do that, I think that we're entitled to make a valid presumption that are data's too high, otherwise they would show us our data.

David Krech, FCC

Any other comments from the panel?

Ben Johnson, Ben Johnson Associates

I'd like to just reiterate and clarify the point about the switch equipment prices and discounts. As somebody earlier said, many of us on the panel have a pretty good feel for those numbers, but we are all hampered by an attempt by a very small oligopoly of switch manufacturers to keep this a secret. But the FCC has certainly the ability to change that dynamic. They can simply require disclosure and that's a *force majeure* that's going to override these contractual issues, and certainly it could be negotiated. But more importantly, there are ways that you could generate the data, get a large sample size that everybody could work with that still protect whatever limited private interests

there might be existing in keeping this a so-called secret. I call it "so-called," because as an economist I say all they're trying to do is to make sure the public pays more for switches than they need to. Supposedly they think that if there's some — maybe some small number of LECs out there that don't realize you can get a big discount, and I guess by keeping it a secret they hope to keep the overall average price a little higher than if it were public.

Again, I think the public interest supersedes whatever private interest that the handful of switch manufacturers might have in trying to keep this a secret. And I agree you can draw a line very detailed terms and conditions that get unique. There's no need for that for the public and that's the remaining edge of privacy that might be legitimate to protect.

Joel B. Shifman, Main Public Utilities Commission

In order to validate the model (inaudible) let's see non-Tier 1 fill out the Tier 1 ARMIS data once, just once. Just so I could use some of those numbers as developing sort of what I call proxy benchmarks against which I could look at this aggregated Tier 1 data. And if, you know, its a two-edged sword. If the small companies are worried about what proxies are to do to them, to make the model work so it doesn't kill them they should be willing to fill out at least one so they're consultants. Sort of a Tier 1 ARMIS type information so that you can validate.

Richard Emmerson, INDETEC International

And I think you could be more specific in that; you don't need the entire ARMIS. Frankly, there are sections of ARMIS that I'm not sure the RBOCs should required to continue to fill out.

Joel B. Shifman, Maine Public Utilities Commission

You're right. You're right.

Richard Emmerson, INDETEC International

One very brief comment. I think there are some precedents, too, at the FCC such as the ONA proceeding in which some of that data was examined and those precedents could be examined to determine where one goes from here.

David Krech, FCC

Did you want to add anything, Lisa?

Lisa K. Hanselman, GVNW Inc./Management

The problem is that I don't have the finer breakdown and that's where it fell apart trying to run the Hatfield Model, actually, because their algorithms in some of the categories in the breakdown of the ARMIS data that we couldn't populate and so we couldn't get a result. And that's specifically where the